HONOLULU
LA JOLLA
MONTEREY
TIBURON

SOUTHWEST FISHERIES CENTER

MONTHLY REPORT - OCTOBER 1979

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SOUTHWEST FISHERIES CENTER
LA JOLLA, CALIFORNIA

HONOLULU LABORATORY
LA JOLLA LABORATORY
TIBURON LABORATORY
PACIFIC ENVIRONMENTAL GROUP

MONTHLY REPORT - OCTOBER 1979

STATUS OF PUBLICATIONS

Published

Barham, Eric G. 1979. Giant larvacean houses: Observations from deep submersibles. Science 205(4411):1129-1131.

The abundance of large, previously unknown larvacean feeding structures in the deep ocean is a striking contrast to the rarity of such forms taken in net hauls. In some areas, abandoned houses and their disintegrated parts provide a substrate for other organisms and contribute to organic aggregates.

McLain, D.R., F. Favorite and R.J. Lynn. 1979. Marine environmental conditions off the Pacific coast of the United States, January 1977-March 1978. Marine Fisheries Review 41(5-6):48-49.

Methot, Richard D., Jr. and David Kramer. 1979. Growth of northern anchovy, Engraulis mordax, larvae in the sea. Fishery Bulletin, U.S. 77(2):413-423.

Northern anchovy larvae from 12 samples collected at 13.0-16.2° C in the Southern California Bight were aged using daily growth increments in sagittal otoliths, and growth rates were calculated from size at age data. In nine samples, growth rate at 8 mm was very similar, ranging from 0.34 to 0.40 mm per day. Growth in the other three samples ranged from 0.47 to 0.55 mm per day. There was no correlation between growth rate and temperature within this set of field samples, but the range of growth rates was similar to the range expected from laboratory rearing experiments in the temperature domain. In no case was growth in the sea as slow as growth in the laboratory on severely limited rations. Anchovy

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larvae which obtain enough food to survive apparently obtain enough food to grow rapidly.

Perrin, W.F., W.E. Evans and D.B. Holts. 1979. Movements of pelagic dolphins (Stenella spp.) in the eastern tropical Pacific as indicated by results of tagging, with summary of tagging operations, 1969-76. NOAA Technical Report NMS SSRF-737, 14 p.

Through 1976, 3,712 small cetaceans were tagged in the course of research cruises operating out of the Southwest Fisheries Center. These included 2,996 spotted dolphins, Stenella attenuata; 324 spinner dolphins, S. longirostis; 193 common dolphins, Delphinus delphis; and 113 bottlenose dolphins, Tursiops truncatus. Others tagged in small numbers included Pacific whitesided dolphins, Lagenorhynchus obliquidens; striped dolphins, Stenella coeruleoalba; and a short-finned pilot whale, Globicephala macrohynchus. Several types of tags were used. Tags have been recovered from 97 spotted dolphins and 7 spinner dolphins. Time at liberty ranged from less than 2 h to more than 4 yr. Net distance traveled ranged from 7 to 582 n.mi. Average short-term movement in the spotted dolphin is 30-50 n.mi./day; range is 200-300 n.mi. in diameter, and seasonal onshore-offshore migrations may exist.

Smith, Paul E. and Sally L. Richardson. 1979. Selected bibliography on pelagic fish egg and larva surveys. FAO Fish. Circ. No. 706, 97 p.

The authors have put together a bibliography on pelagic fish egg and larvae surveys which is fairly complete through 1973 and which can be taken as a rough measure of the vigor and growth of this field of fishery research. Almost all of the entries (well over a thousand) are from this century. The publication rate has risen from approximately one title per year around 1910 to ten per year around 1940 to some 50 per year around 1970. Essential descriptive work on the immature stages of fish is still a major contribution to the new literature and it appears there is also much basic work in progress on survey techniques.

Squire, James L. and Susan E. Smith. 1979. Sportfishing in Hawaii, Guam and American Samoa. Charles E. Tuttle Co., Rutland, Vermont, 53 pages, illustrated.

Most of the material in the above publication was reprinted from the Angler's Guide to the United States Pacific Coast, originally published by the U.S. Department of Commerce, National Marine Fisheries Service.

Approved by Center Director

Riggs, Fletcher V. Vertical distribution and migration patterns of the Hawaiian midwater Penaeidae. For publication in Fish. Bull., U.S.

Scheffer, Victor B. and Albert C. Myrick, Jr. A review of studies of growth layers in the teeth of marine mammals to 1970. For publication in International Whaling Commission Aging Symposium Papers.

Shomura, Richard S. and Richard A. Barkley. Ecosystem dynamics of seamounts--A working hypothesis. (Abstr.) For publication in Proceedings of the Fourth Symposium on the Cooperative Study of the Kuroshio and Adjacent Regions.

Translations

Tanaka, Tamotsu. n.d. Atlas of skipjack tuna fishing grounds in southern waters, 1978 fishing season (June 1978-May 1979). Translation from the Japanese of a draft report [received June 1979] provided by Kohei Kasahara, Tohoku Regional Fisheries Research Laboratory, Shiogama, Miyagi, Japan. (Translated by Tamio Otsu, 1979, 39 p., Translation No. 39).

Administrative Reports

Honolulu Laboratory

Polovina, Jeffrey J. 1979. Analysis of catch and effort data for the spiny lobster, Panulirus marginatus, at Necker Island. SWFC Adm. Rep. H-79-18, 18 p.

Matsumoto, Walter M., Thomas K. Kazama and Donald C. Aasted. 1979. Anchored fish aggregation devices in Hawaiian waters. SWFC Adm. Rep. H-79-19, 34 p.

Uchida, Richard N., Bernard M. Ito and James H. Uchiyama. 1979. Survey of bottom fish resource in the Northwestern Hawaiian Islands. SWFC Adm. Rep. H-79-20, 19 p.

Uchida, Richard N. 1979. Current status of fisheries in the Hawaiian Islands. SWFC Adm. Rep. H-79-21, 14 p.

Yuen, Heeny S.H. 1979. To all billfishers. SWFC Adm. Rep. H-79-22, 13 p.

Shomura, Richard S. (Chairman). Summary report of the planning workshop for National Marine Fisheries Service research on marine turtles in the central and western Pacific. SWFC Adm. Rep. H-79-23, 13 p.

Balazs, George H. 1979. Synopsis of biological data on the green turtle in the Hawaiian Islands. SWFC Adm. Rep. H-79-24C, 180 p.

La Jolla Laboratory

Mackett, D. 1979. SWFC Current Year Task Plans - FY 1980. SWFC Adm. Rep. LJ-79-33.

HONOLULU LABORATORY

RESOURCE ASSESSMENT AND DEVELOPMENT INVESTIGATIONS (RADI)

Cromwell Cruise to Samoan Waters Completed

The NOAA research vessel, Townsend Cromwell, returned from cruise 79-04 on October 25 after completing a 2-month cruise around Samoan waters. According to Insular Resources Task Leader Richard N. Uchida of the Honolulu Laboratory, scientists on the cruise included Chief Scientist Walter M. Matsumoto and Research Assistants Bert S. Kikkawa, Paul M. Shiota, and Darryl T. Tagami. Also participating in the cruise were cooperating scientists and fishermen including Pio Gaisoa, Nimo Laupapa, Frank McCoy, Paul Pedro, William Pedro, and Dr. Richard Wass of American Samoa and Alphonse Philipp of Western Samoa.

The cruise was a joint effort between Honolulu Laboratory and fishery organizations of American Samoa and Western Samoa and included a survey and assessment of insular resources and the anchoring of fish aggregating devices in Samoan waters.

Ten fish aggregating buoys were successfully anchored around American Samoa and five more around Upolu Island, in Western Samoa. The buoys were similar in design to those used successfully in Hawaiian waters during the past 2 years and were generally anchored close to shore (within 10 mi); 2 of the 10 buoys at American Samoa were placed 20 to 25 mi offshore for the benefit of tuna purse seine vessels fishing in the area.

The resource survey also included fishing trials with lobster, fish, and shrimp traps, crab nets, and handlines for bottom fish and crustacea, and dredges for precious corals. According to Matsumoto, trap fishing for lobsters and fish was generally poor, but trapping for shrimps at depths of 150 to 300 fathoms was moderately successful. Two species of shrimps, Heterocarpus ensifer and H. laevigatus, were prevalent, though not in commercial quantities and kona crab, Ranina sp., was found for the first time in American Samoa. Handlining for bottom fish in 120 to 300 fathoms was excellent at Pasco Bank, 90 miles west of Western Samoa, where 800 pounds of ehu, Etelis marshi, and onaga, E. carbunculus, were taken during 45 line-hours of fishing.

Discussion Held on Biomass Model for the Northwestern Hawaiian Islands

Dr. Jeffrey J. Polovina, Statistician, spent one week at the Northwest and Alaska Fisheries Center this month working with Dr. Taivo Laevastu and Pat Livingston on the DYNUMES bulk biomass model for the Northwestern Hawaiian Islands (NWHI). The model focuses on the dynamics of fish species and apex predators which are used as input variables. Polovina also had useful discussions with Drs. Michael Tillman and Bruce McAlister on some of the drawbacks of the model.

List of Fishes and Crustaceans Compiled for Possible Management

Fishery Biologist R. Uchida compiled a list of species to be considered for possible management by the Scientific and Statistical Committee (SSC) of the Western Pacific Regional Fishery Management Council (WPRFMC). The species list, accompanied by background information on distribution, catch, and life history, included mahimahi, Coryphaena hippurus and C. equiselis; rainbow runner, Elagatis bipinnulata; bigeye scad, Trachurops crumenophthalmus; mackerel scad, Decapterus macarellus, D. maruadsi, D. russellii, and D. macrosoma; wahoo, Acanthocybium solandri; dogtooth tuna, Gymnosarda unicolor; Japanese mackerel, Scomber japonicus; the pandalid shrimps, Heterocarpus ensifer and H. laevigatus; slipper lobser, Scyllarides squammosus and Paribaccus antariticus; the penaeid shrimp, Penaeus marginatus; and squids, Sepioteuthis lessoniana, Symplectoteuthis oualaniensis, and Nototodarus hawaiiensis.

Amberjack Sampling Continued for Ciguatera Study

Research Assistant Bernard M. Ito continued to sample amberjack, Seriola dumerilii, for ciguatera analysis. From September 24 to October 24, 88 kahala were sampled, of which 4 (5%) were rejected for being borderline or positive in toxicity. The rejected fish ranged in weight from 0.79 to 12.47 kg (1.75 to 27.5 lb) and were caught at various locations in the Hawaiian Islands.

Since the beginning of the testing program to date (April 17 to October 24), 751 kahala have been tested for toxicity and of these 102 (14%) have been found to be toxic or borderline toxic.

* * * * * * * * * *

Uchida prepared a fishery briefing document on the Cook Islands for the Director's Office, reviewed the State of Hawaii's "State Conservation Land Plans," which includes various references to shoreline development and marine sanctuaries, and continued to work with Research Assistant P. Shiota on a manuscript which describes recent trends in Hawaiian fisheries. The manuscript will consider changes in vessel design, the expansion of the handline and trap fisheries into the NWHI, the troll fishery for mid-Pacific albacore, and aquaculture.

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Resarch Assistants Robert L. Humphreys, Jr., Linda C. Hubbell, and Victor A. Honda continued processing and analyzing stomach contents and ovaries from kahala, Seriola dumerilii, and egg masses from spiny lobster, Panulirus marginatus.

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Thomas S. Hida, Fishery Biologist, continued to process seabird spew samples in a study on the feeding habits of seabirds. Hida also interviewed a graduate student (for possible hire by the Fish and Wildlife Service) to aid in processing the spew samples.

Hawaiian Skipjack Tuna Landings Continue Below Long-Term Average

The October 1979 Hawaii landings of skipjack tuna were estimated at 71.5 metric tons (MT), which is 70.0 MT below the October 1978 landings and 200.1 MT below the 1948-78 long-term average for October. The cumulative landings from January through October were estimated at 2,592.8 MT, which is 101.5 MT below the 1978 landings for the same period and 1,385.9 MT below the 1948-78 long-term average for the same period.

FISH ENVIRONMENT INVESTIGATIONS (FEI)

Manuscript on Skipjack Tuna Respiration Study Revised

Reginald M. Gooding, Fishery Biologist, made revisions to the manuscript "Respiration rates and low oxygen tolerance limits in skipjack tuna, Katsuwonus pelamis," based on reviewers' suggestions. The manuscript will be sent to the Center for approval in the near future.

Equipment Maintenance Chores Occupy Researchers at Kewalo Research Facility

Dr. Andrew E. Dizon, Leader, Experimental Ecology of Tunas Task at the Honolulu Laboratory, reported that most of the Task researchers were involved in routine maintenance of equipment. Dr. Dizon and Research Assistant Martina K.K. Queenth continued to work on the behavioral thermoregulation tank system and Randolph K.C. Chang, Fishery Biologist, worked on the cover for the tuna respirometry tank. Queenth and Research Assistant Sharon Hendrix continued to prepare laboratory space and equipment to culture food for tuna larvae. These preparations are apart of long-range plans to induce tuna to spawn during the summer of 1980.

* * * * * * * * * *

S. Hendrix, M. Queenth and Laura Duffy, Hawaii Loa College student, experimented with different diets and food presentation methods (e.g., gels embedded with food material) to determine their acceptability by long-

established tunas in holding tanks. Small (ca. 30 cm) kawakawa, Euthynnus affinis, seemed to accept almost anything.

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Dr. Dizon worked with Lt. H. Al Jemison on computer programs to reduce data collected during the recent North Pacific albacore tracking cruise. Dr. Dizon also worked with Dr. Robert Nakamura, Animal Science Department, University of Hawaii, on a rewrite of the burnt tuna manuscript.

* * * * * * * * * *

Heeny S.H. Yuen, Leader, Recreational Fisheries Task, completed the report on the 21st Hawaiian International Billfish Tournament and worked out a plan to analyze Japanese longline catch and effort data to determine striped marlin, Tetrapturus audax, migrations. He also assisted H. Jemison in calibrating ultrasonic transmitters that will be used in tracking fish and started a literature search on mahimahi and wahoo.

LA JOLLA LABORATORY

Coastal Fisheries Resources Division

Staff of Coastal Division is a Major Participant in 1979 CalCOFI Conference

The Coastal Division was a major participant in the 1979 CalCOFI Conference held October 23-25 in Idyllwild, California. A variety of topics were covered by personnel from the Division. The following is a listing of the papers given:

1) Egg cannibalism in the northern anchovy Engraulis mordax. (J.R. Hunter and C.A. Kimbrell).

2) Sexual maturity, spawning frequency and fecundity of the northern anchovy, Engraulis mordax, during the 1979 spawning season (J.R. Hunter and B.J. Macewicz).

3) Staging and aging of northern anchovy eggs (E.H. Ahlstrom, presented by Paul Smith).

4) Birthdate distribution of the 1978 anchovy year class (R. Methot).

5) Replicate samples of anchovy eggs at sea (Paul Smith).

For the first time a poster session was included in the Conference and attendees had an opportunity to view and study in a relaxed manner the posters given by the following persons from the Coastal Division:

1) Effect of container size on growth and condition of jack mackerel Trachurus symmetricus) larvae (Gail Theilacker).

2) Tests of a new particle data collection instrument for use on CalCOFI surveys (Reuben Lasker & Jack Brown).

3) Observations on the early life history of the mussel blenny, Hypsoblennius jenkinsi, from specimens reared in the laboratory (Betsy Stevens).

4) Early life history of the stromateid fish, Peprilus semillimus (Susan D'Vincent).

5) Multispecies aspects of the ichthyoplankton in the California Current and adjacent waters: seasonal and geographic distributions (Valerie Loeb).

6) Update of the mortality rate of Engraulis mordax in Southern California (Doyle Hanan).

Prior to the CalCOFI Conference, the semi-annual meeting of the INP/CalCOFI Coordinating Committee was held on October 22 in the SWFC Auditorium. Dr. Jorge Carranza (Director, Instituto Nacional de Pesca, INP) led the Mexican delegation. Other Mexican participants included Alejandro Villamar, Maritza Escudero, Ernesto Castellanos, Oscar Pedrin, Dilio Fuentes and Walterio Garcia. Dr. Reuben Lasker substituted for Izadore Barrett, Director of the Southwest Fisheries Center at this meeting. Other coordinating members present were: John Radovich (CF&G) and Joseph Reid (SIO). Richard Schwartzlose, Alec MacCall, Gary Stauffer, Dan Huppert and Paul Smith all attended. At the meeting there was a report of the September bilateral talks between Mexico and the U.S. on anchovy research. An ad hoc subcommittee was appointed to look into common means of modeling the anchovy population. This ad hoc committee met at the CalCOFI Conference in Idyllwild. Subcommittee reports included those on catch per unit effort, plankton and hydrography, acoustics, aging and sampling, data management, and modeling. The CalCOFI Coordinator, George Hemingway, announced that SIO had obtained Sea Grant funding for training INP members in the technical areas of oceanography and biology.

The Plankton and Hydrography Subcommittee report to the INP/CalCOFI Coordinating Committee included a review of the egg/gonad anchovy biomass assessment technique. An excerpt from that report follows.

Gonad Anchovy Biomass Assessment Technique

Recognizing the need for an anchovy biomass estimation method where all the parameters can be estimated, the staff of the Coastal Fisheries Resources Division of the Southwest Fisheries Center has been attempting to perfect one. The method is based on an original finding by Dr. Moser that post-ovulatory follicles can be seen and used to determine time of spawning in rockfish. Drs. Hunter and Goldberg, with histology technician Macewicz, following upon this suggestion developed criteria for aging post-ovulatory follicles in anchovy and hence the frequency of spawning of natural populations. This was confirmed using Mr. Leong's laboratory breeding anchovies. The results from field sampling of anchovies in 1978 and 1979 provided the fecundity data needed for biomass assessment using Mr. Parker's model. Incidence of females with post-ovulatory follicles or hydrated eggs could be used as a measure of spawning frequency. Parker's model, where all parameters can be estimated, uses an estimate of egg production divided by the product of batch fecundity and the proportion of females in the mature stock and accounts for the fact that spawning is relatively continuous in anchovies. Estimates of egg production are derived from direct plankton net sampling using a newly designed net for rapid vertical towing, the CalVET net. P. Smith designed the net, conceived the idea of sampling small numbers of eggs, set up the sampling frequency and guided the procedure at sea, and J. Zweifel developed analytical procedures to estimate the natural mortality and the contagious distribution of the eggs. The small size of the net sampler is advantageous because it reduces the variance of the estimate and the samples can be sorted at low

cost. Dr. Ahlstrom developed the criteria for staging the eggs; mortality rates from frequency of stages in the samples has been analyzed by J. Zweifel. This permits an estimate of the actual number of eggs spawned.

Information on batch (weight-related) fecundity and spawning frequency is now firmly established but the frequency of sampling for eggs was done incorrectly in 1979 and will have to be repeated in 1980. At least 800 independent egg samples are required for an anchovy population estimate with a standard error of 12%. However, 1979 sampling was done so that 8 samples were taken at each station. Dr. Smith discovered on subsequent analysis that the eggs were highly contagious and that 8 samples in each set were highly correlated and actually represented only 1 sample. In 1980, we intend to take only one CalVET tow per station to eliminate this problem.

Coastal Division Staff to Utilize Scripps' New Satellite Facility

On October 12, Scripps Institution of Oceanography dedicated a new satellite facility which is located within 100 yards of the Southwest Fisheries Center. There is no other facility in or outside government that can directly receive data from satellites with ocean sensors while simultaneously processing and analyzing the data. The Coastal Division plans to make use of this facility to investigate how and whether satellite observations can be useful in a variety of studies on fishery problems. Currently we are utilizing the facility and are providing ground truth for satellite observations during Jordan operations. This month, Drs. Lasker and Laurs received a $10,000 grant from the California Space Group, an in-house University of California granting agency for remote sensing, to do exploratory work on the application of satellite imagery to anchovy recruitment and albacore availability problems.

LARVAL FISHES, CALCOFI PROGRAM

Estimate Derived for Number of Times Anchovy Spawn Per Year in the Los Angeles Bight

Dr. John Hunter reports that Technician Bev Macewicz completed histological analysis of all existent collections of anchovy ovaries. These data provided estimates of the probability of spawning for females, based on the presence of day-old post-ovulatory follicles. The data for all years, listed in order of months, is given below along with the average relative abundance of anchovy per month for the years 1953-1960 (from Smith and Lasker, 1978).

Month	Relative larval abundance	Probability of spawning			
		Cruise dates	Year	N	Probability
Jan.	1000				
		Jan. 26 - Feb. 16	1979	395	0.134
Feb.	2000	Feb. 15 - 27	1978	295	0.159
Mar.	2040	March 20-21	1977	148	0.142
		March 24 - Apr. 14	1979	557	0.102
Apr.	2425				
May	1620	May 7-11	1978	16	0.062
June	960	June 9-19	1979	33	0.034
July	690				
Aug.	230				
Sept.	210	Sept. 9-10	1977	14	.000
Oct.	130				
Nov.	520				
Dec.	380				

The decline in the probability of spawning corresponds well with the decline of average larval abundance. The area under the curve from the spawning probabilities data indicates that females spawned about 15 times over the period from January 26 - September 10. As no data existed for females during the rest of the year (September 11 - January 25), Hunter and Macewicz estimated the number of spawnings occurring in this period from the mean larval abundance. They assumed the number of spawnings occurring in this period (September - January) was proportional to the area under the larval abundance curve for that period, adjusted by the ratio of the areas under the larval abundance and spawning probabilities curves for the period, January-September. This calculation indicated that anchovy may have spawned 5 times from September through January. This brings the total number of spawnings per female to twenty for the year.

Another approach to estimating the annual number of spawnings per female is to use the mean spawning probability occurring during the period for which the most data is available, February-April; the mean spawning probability during this period was 0.134, indicating that females spawned 12 times over the 90-day period. The mean abundance of anchovy larvae in February-April was 53% of the total abundance for the year indicating the total number of spawnings per female was about 23 for the year.

Thus the Hunter-Macewicz calculations indicate that anchovy females spawned about 20-30 times per year. The mean batch fecundity of anchovy is about 400 eggs/g, hence the total annual fecundity is about 8000 eggs/g or about 1.36×10^5 eggs for females of mean weight 17 g.

In Situ Daily Growth Rates of Several Larval Fish Species Compared for Dissertation

Richard Methot, UCSD graduate student is comparing the *in situ* daily growth rates of several species of larval fish as part of his dissertation research at Scripps Institution of Oceanography. He is currently working on myctophid larvae collected with an Isaacs-Kidd Midwater Trawl throughout the Southern California Bight in June 1978. Sufficient data are available from 3 species of myctophids, *Triphoturus mexicanus*, *Lampanyctus regalis* and *L. ritteri* to compare their growth to that of the abundant engraulid, *Engraulis mordax*, the northern anchovy. Throughout the 8-17 mm length range, the two species of *Lampanyctus* have similar mouth sizes, ages and weights, but differences exist between the genera.

Comparison among genera at a length of 15 mm and at an age of 30 days.

Genera	Standard length(mm)	Dry weight(g)	Otolith radius(um)	Age (days)	Growth rate (mm/day)	Mouth size
Engraulis	15	.0010	67	25	.47	small
	18	.0020	95	30		
Triphoturus	15	.0045	90	43	.36	medium
	10	.0016	53	30		
Lampanyctus	15	.0070	135	60	.29	large
	6.5	.0006	55	30		

The inverse correlation between mouth size and growth rate is interesting. Unfortunately, nothing is known about the foraging tactics and preferred prey of the myctophids. As data from more diverse species are collected, Methot hopes to identify alternative life history strategies employed to maximize larval survival.

COMMERCIAL AND RECREATIONAL FISHERIES RESEARCH FOR MANAGEMENT

SWFC Devotes Sizeable Effort to Stock Assessment Activities

A package of reports on SWFC stock assessment activities and methodologies was prepared by Dr. Gary Stauffer for the NMFS Stock Assessment Task Force headed by Dr. D.L. Alverson, Director of the NMFS Northwest Fisheries Center. Based on research programs of the four laboratories within the Center, Dave Mackett, the Center's Planning Officer, estimated that approximately $5.7 million and 113 person-years currently working in 25 tasks, perform stock assessment or closely related activities. This is out of a Center budget of approximately $8.5 million and 216 person-years. The emphasis in SWFC stock assessment programs is on tunas of the Atlantic, central and western Pacific; coastal pelagic species of California; coastal groundfish and rockfish resources; insular resources of Hawaii; and marine mammals, particularly the major porpoise stocks of the eastern tropical Pacific. The package included four synopses of stock assessment methods utilized by SWFC researh programs. These are aerial surveys by line transects (by T. Smith and R. Holt), sonar mapping acoustic surveys, fish egg and larva surveys, and aerial surveys by commercial fish spotters (by G. Stauffer). Headquarters and other Centers are also contributing sections for the report on other stock assessment methods and NMFS involvement in stock assessment.

Review Held on Anchovy-Brown Pelican Issue

A review of the pelican issue relative to the anchovy management plan was held at UC Davis. This was one of the preliminary steps of the Section 7 consultations between National Marine Fisheries Service and U.S. Fish and Wildlife Service required by the Endangered Species Act. Participants were from National Parks Service, Fish and Wildlife Service, UC Santa Cruz, UC Davis, Natural History Museum of Los Angeles County, California Department of Fish and Game, and National Marine Fisheries Service. Pelican experts presented information on population status, reproductive dynamics, and foraging strategy. Surveys of the Anacapa breeding colony in 1979 indicated that 1200 nests were attempted and 800 chicks were successfully fledged. Although this was the most successful year recorded for the colony, it is not up to the standard of 1.0 fledgling per nest that has been observed in Gulf of California colonies. The Anacapa pelicans still experienced some thin egg shells and some nests were abandoned. Feeding studies this spring found anchovies to make up over 90% of the pelican's diet during nesting. The feeding grounds for the colony was restricted to the area north of Anacapa and generally in the area of Ventura flats.

Dr. Gary Stauffer and Alec MacCall from the SWFC presented the status of current knowledge of anchovy biology abundance and fishery. The critical habitat of anchovies with respect to pelicans on Anacapa Island is the upper two feet of the eastern half of the Santa Barbara channel. Unfortunately, neither the CalCOFI egg and larvae survey nor the CFG Sonar Mapping Survey adequately measures the availability of anchovies to pelicans in this zone. The aerial spotter index may prove to be more pertinent to the measurement of anchovy availability.

Gary Smith (SWR), the meeting's convenor, will present a report to the Pacific Fishery Management Council on this subject in November.

Anchovy Catch/Effort Study Continuing

In a continuing effort to determine whether logbook data provide a useful measure of anchovy abundance, logbooks of seven anchovy seiners have been entered into computer files. The period covered is 1966-1975, and the logs for 1975-1979 are being coded for keypunching. Doyle Hanan (CFG) will be analyzing the computer files once they are completed.

Domestic Demand for Fish Meal

Dr. Huppert (with assistance from J. McMillan) has revised the manuscript entitled, "An analysis of U.S. demand for fish meal," for resubmission to Fishery Bulletin.

SURVEY SYSTEMS DEVELOPMENT AND EVALUATION PROGRAM

Novel Method Under Development for Analyzing Development Rate of Pelagic Fish Eggs At Sea

Dr. Paul Smith, Leader of the Survey Systems Analysis and Evaluation Program, has begun the use of time series analysis to improve the ability to compare field rates of anchovy egg development with those rates determined in the laboratory. The two procedures used are the auto-correlation function and the cross-correlation function. The test data to which these procedures have been applied is a set of 102 samples at 4 hourly intervals from which anchovy eggs were removed and staged by the late David Kramer. The auto-correlation function is used to estimate the duration of each stage. The procedure used correlated the incidence of eggs at each 4-hour sample with the incidence of eggs 4 hours later, 8 hours later, 12 hours later, and so on. Low correlation at 4 hours lag but high correlation with 24 hours lag is interpreted as a stage of short duration (<4 hours) with a daily cycle, for example. The cross-correlation function is used to estimate the time between the incidence of adjacent stages. For example, the cross-correlation function for stage I and stage II eggs exhibits a maximum 8 hours lag, but significant correlation at 4 hours lag and 12 hours lag. In this procedure the peak cross correlation is interpreted as the estimate of mean interval between adjacent stages and

the cross correlation remaining in the adjacent time intervals is regarded as a result of the combined auto-correlations within the stages being compared.

Mathematician James Zweifel has published a temperature model for the development rate of anchovy embryos. Laboratory data have been generated by the late Dr. Ahlstrom and Carol Kimbrell, Fishery Biologist, to evaluate the timing of stages with a short spawning interval and constant temperature. These data, a temperature function, and field data may now be evaluated together to discern the effect of prolonged spawning in the field (ca. 8 hours) and the effect of eggs changing temperature strata during development. The models which result can then be used to refine estimates of embryonic mortality rate and conversely estimates of egg production in the sea. Egg production rates have been proposed as an alternative to larva standing crop for the estimation of spawning biomass of pelagic fish stocks for improved management.

Effects of Wind-Mixing on Ocean Thermal Structure Studied

L. Eber, Oceanographer, has been looking at computer models of thermal structure in the upper mixed layer of the Pacific Ocean for possible application in the CalCOFI area. It is believed that anchovy larval survival may depend, in part, on adequate concentrations of food organisms in thin stratified layers. This stratification can be altered and the organisms dispersed by the onset of strong winds. The computer models predict changes in the thickness and temperature of the mixed layer from information on the intensity of wind-mixing and radiative and other heat fluxes at the ocean surface.

While ultimately intended for appplication in real-time situations, initial tests with one of the models have been run under mean seasonal conditions using subsurface temperature data from CalCOFI station 80080 along with mean monthly wind and heat flux data. Preliminary results from runs in which the time integration was made with hourly increments over 90-day periods are encouraging, but indicate that horizontal advection should be incorporated into the model for CalCOFI stations such as 80080 which are in the California Current.

MULTISPECIES TAXONOMY

Analysis of Feeding Habitats of Hake Larvae Underway

An analysis of the feeding habits of hake larvae is being carried out by Barbara Sumida MacCall, Fishery Biologist, as part of a collaborative study with Dr. G. Moser on the feeding habits and alimentary structure of the major types of larvae that occur in the California Current region. The feeding incidence for 153 larvae examined from 11 day and night samples was 93%. This is remarkably higher than in the anchovy where Dr. David Arthur found a

maximum of 20% in day samples. The relationship of mouth width to body length has been established and data on prey composition and size for hake larvae of various developmental stages are being compiled.

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The Manta net (surface) samples for 1978 have been sorted and are being identified along with the oblique samples from 1978 cruises. Data from the latter are being entered into the data base by the identifiers using the MIDAS system.

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Dr. K. Kawaguchi of the Ocean Research Institute, University of Tokyo, arrived for a 6-month stay in the Multispecies Taxonomy laboratory. He will use the CalCOFI fish egg and larva collection to broaden his background in systemic aspects of ichthyoplankton.

ALBACORE FISHERIES PROGRAM

1979 U.S. Albacore Landings Low

The 1979 U.S. albacore fishery has been one of the poorest on record according to Dr. R. Michael Laurs, Leader of the Albacore Fishery Investigations Program. Landings through October total about 5,500 tons. This compares to a seasonal total for the U.S. fishery in 1978 of 18,500 tons and to the seasonal 10-year average of about 23,000. There appear to be a number of factors contributing to the low landings of albacore in 1979 including (1) the late arrival of both the "northern" and "southern" substocks of fish into North American coastal waters; (2) generally weak or non-existent temperature fronts along much of the U.S. West Coast, especially off the Pacific Northwest, as the result of low coastal upwelling, causing fishing in many areas to be spotty, scattered and lasting only a few days in given locations because fish were on the move; (3) high winds and rough seas hampered fishing effort notably off central and northern California; (4) fish not biting, in particular in the Cortez Bank area and off central California; (5) low availability of 12-15 pound (5.5-6.8 kg) fish off California which normally make up a significant portion of the U.S. catch; and (6) closure of waters within 200 miles of the coast of Canada to U.S. albacore fishermen.

During the last half of October, albacore catches were made in the offshore area between Monterey and San Francisco; however, as has been the case throughout most of the 1979 season, poor weather conditions hampered fishing efforts. Jigboats averaged 20-50 fish a day and baitboats about a ton a day while working 30-50 miles offshore Monterey to the Farallon Islands during the third week of October. The size of the albacore caught averaged

20-25 pounds (9.1-11.4 kg) and only a few 7-8 pounders (3.2-3.6 kg) were among the fish landed. During the last week in October, strong winds and rough seas forced most of the boats into port and many stayed in port for the remainder of the month. Should weather conditions improve, a number of commercial fishermen plan to resume fishing for albacore in the Monterey vicinity. Jigboats continued to fish the area 360 miles west of the Columbia River during the first half of October, but departed the area during the last half of October because of rough seas.

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Albacore fishery scientists at the NMFS La Jolla Laboratory continued making preparations for a cruise to investigate the migration route followed by the "southern" substock of albacore on their seasonal departure from coastal waters off California. The cruise will be conducted mainly between 30°-35°N and 135°-145° W from aboard the R/V David Starr Jordan between November 1 and November 30 with Ron Lynn as Chief Scientist. Research operations will include (1) oceanographic measurements with emphasis on locating and defining the ocean frontal structure associated with the Subtropic Front which is believed to influence albacore migration; (2) albacore fishing with experimental vertical longlines to test for the occurrence of albacore in the vicinity of the ocean fronts where surface waters may be too warm for trolling; and (3) special studies to evaluate the feasibility of using ocean color measurements, made by a recently launched satellite, to determine ocean conditions related to albacore migration.

Oceanic Fisheries Resources Division

Synoptic Weather Data Observations Increase During September

During September 1979, 19 tuna seiners contributed synoptic weather data to the NMFS FAX advisory program. A total of 235 weather and 31 XBT observations was reported via NMFS-licensed radio station WWD. The table below compares program participation during September 1978 and 1979, showing a 13% increase in total observations in 1979 over September 1978.

	September 1978	1979
Number of vessels with equipment	50	44
Number of vessels reporting	29	19
Number of weather observations reported	216	235
Number of XBT observations reported	20	31
TOTAL OBSERVATIONS	236	266

Leading all program participants this month were the captains and crews of the Cabrillo, Cheryl Marie, Claudia B, and Christina C. NMFS wishes to thank these and all other contributors to the NMFS FAX program.

Scientists Report to ICCAT Commissioner and Advisors

Dr. Gary T. Sakagawa, Chief Oceanic Resources Division, and Dr. Wes Parks, Leader, Tuna and Billfish Resources Program, attended a meeting of Commissioners to the International Commission for the Conservation (ICCAT), and tuna industry advisors in Washington, D.C., October 29 to November 1. The scientists presented documents to the commissioners and advisors in preparation for the upcoming meeting of the ICCAT in Madrid, Spain November 7 through 20, 1979. Among the presentations were the U.S. National Report to ICCAT, the report of U.S. participation in ICCAT's International Skipjack Year Program, and situation reports on north and south Atlantic albacore, Atlantic yellowfin tuna, Atlantic skipjack tuna, and Atlantic bigeye tuna.

Biological Sampling of Foreign Imports of Atlantic Tunas Continues in Puerto Rico

Atlantic-caught tunas transshipped to Puerto Rico have been sampled routinely for biological information by Technician Eugene Holzapfel of the La Jolla Laboratory since March 1975. Data on fork length, weight, and species composition were collected.

Results of sampling during the period January through October 1979 reported by Fishery Biologist James Renner are:

Species	Gear	No. of Samples	No. of Fish Sampled	Tonnage Sampled (MT)
Yellowfin	Baitboat	41	2486	623
Skipjack	Baitboat	21	1064	2790
	Purse Seine	7	354	2732
Bigeye	Baitboat	31	1511	352
Albacore	Longline	2	81	541
TOTAL		102	5496	7038

MARINE MAMMAL BIOLOGY AND TECHNOLOGY PROGRAM

SWFC Staff Participates in Marine Mammal Conference

The Third Biennial Conference on the Biology of Marine Mammals was held in Seattle, Washington, October 8-10 and was attended by nine scientists from SWFC: Frank Ralston, Computer Specialist; Dave Holts, Fishery Methods Specialist; James Coe, Fishery Biologist; John Henderson, Fishery Biologist; Larry Hanson, Biological Technician; Jacqueline Jennings, Fishery Biologist; and Drs. William Perrin, Al Myrick and Warren Stuntz, Wildlife Biologists. Jennings acted as Chairperson for the conference session on current applications of technology and presented two papers describing the progress of her work in development of conventional and satellite-linked marine mammal tagging systems. Stuntz, Leader of the Marine Mammal Behavior and Physiology Project, presented a paper on learned evasive behavior, co-authored by Perrin and Myrick, presented a paper on qualitative adaptive models for pelagic and river dolphins. The abstracts of papers by members of the Center are:

1. Preliminary Results of a Dolphin Tagging Study
(Jacqueline G. Jennings)

The National Marine Fisheries Service has developed a Porpoise Schools Impoundment System (PSIS) to hold and examine large groups of pelagic dolphins. This system was used during a tagging cruise in the eastern tropical Pacific in September-October 1978. Eight hundred seventy-two dolphins were aged and sexed; 656 were tagged, of which 331 were injected with tetracycline for age determination studies. Approximately 70 resights have been made, most within 500 miles of the release sites. Radio-tracking conducted during the cruise indicated that there was little cohesion of the schools over the short term. Tag resights were made primarily by NMFS observers aboard commercial yellowfin tuna purse seiners. Analysis of fishing effort indicated proportionately greater coverage of the 50 x 100 mile study area around Clipperton Island than elsewhere in the fishery thereby increasing the probability of tag resights.

2. Development of a Satellite Linked Tracking System for Marine Animals
(Jacqueline G. Jennings)

A satellite-linked transmitter is being developed to provide information on the range and movements of dolphins involved in the Eastern Tropical Pacific yellowfin tuna purse seine fishery.

Basically, the transmitter oerates at 401.2 mHz, has a 17.8 cm one-quarter wavelength stub antenna, a power output of 0.5 w, and a salt water switch to regulate transmissions. It weighs approximately 500 grams unpackaged. Testing has been through the NIMBUS-6 satellite and has included experiments on captive and wild dolphins to identify problems with the system related to the biology of animals and its environment. Although the transmitter is designed for use on dolphins, it could be modified for use on other marine animals, notably large whales and sea turtles.

3. Learned Evasive Behavior by Dolphins Involved in the Eastern Tropical Pacific Tuna Purse Seine Fishery
(Warren E. Stuntz and William F. Perrin)

An analysis of records obtained by observers aboard tuna purse seiners indicates that dolphins (Stenella spp.) are more difficult to capture in areas where fishing effort has been greatest. In general, as one goes offshore, dolphin schools are more likely to remain intact during the process of herding them into a compact group prepatory to setting the seine. The percentage of the school captured in nearshore areas is 20-40% whereas, in offshore areas 60-80% of the schools are captured. Another measure of learning by the dolphins is the frequency with which sets are aborted without releasing the seine after having begun the herding process. Areas having the greatest effort are generally those where sets are most frequently aborted. The length of time required for herding the animals before letting the net go does not change significantly with learning. This result may be due to a change in the behavior of the fishermen in response to the dolphin behavior.

4. Qualitative Adaptive Models for Pelagic and River Dolphins (Albert C. Myrick)

The wide spectrum of adaptations within the Delphinoidea are elucidated by considering the morphologies of pelagic dolphins and river dolphins as integral parts of their respective adaptive suites. A pelagic dolphin is adapted for open-water foraging for motile prey schools. Its structural design enhances a high-speed and high-endurance swimming capability. Its gregarious social structure permits overlapping long-range sonic search for and consolidation of prey schools. A river dolphin is unstreamlined. Its peculiar form, low speed, high maneuverability, and semi-solitary mode correspond to a bottom feeding niche that depends upon single prey items. Its short-range echolocating system, small eyes, and emphasis on tactility reflect the near-zero visibility and other rigors of a turbid river environment.

Within certain phyletic confines, the adaptive suites of dolphins are materially altered morphologically, behaviorally, and physiologically as species come to occupy other habitats. The adaptive features of the marine "river dolphin," Pontoporia blainvillei, and the river "marine dolphin," Sotalia fluviatilis, underscore the magnitude of such alterations.

Chartered Tuna Seiners Sails to Eastern Tropical Pacific

After successfully completed gear dynamics studies in local waters, the tuna seiner, M/V Maria C J, under charter to the National Marine Fisheries Service departed San Diego on October 7 to continue the charter on the tropical fishing grounds. Aboard are biological technician Darrell Lee and Dr. Gary Worthen (under contract, from Utah State University). Worthen is evaluating field sampling techniques in an effort to examine the feasibility of using chromosomal banding studies in porpoise stock determination. Lee is continuing gear dynamics work begun during the local segment of the charter, including measurement of speed, depth, and tension on the net during backdown with varying amounts of fish and porpoise captured. The cruise is expected to extend into December, but Worthen and his samples will be transferred to a homeward bound vessel in early November.

Joint U.S.-Mexico Marine Mammal Research Discussed

Dr. William F. Perrin, Fishery Biologist and Leader of the Marine Mammal Biology and Technology Program, represented the Southwest Fisheries Center at a meeting with members of the Instituto Nacional de Pesca of Mexico in Seattle, Washington October 23-25. The U.S. Fish and Wildlife Service and the NMFS National Marine Mammal Laboratory were also represented. The status of operating plans for ongoing cooperative research on the West Indian Manatee, the gray whale and for Coastal Marine Mammal Surveys was discussed. New Mexican regulations controlling access to and research within the Guerrero Negro complex and San Ignacio Lagoon were presented. Permit requirements for

ongoing research were also discussed. Plans for aerial surveys of the Gulf of Mexico, joint marine mammal salvage systems, and the exchange of scientists were presented for consideration and comment. Interest was expressed by all parties in possible investigations on the oceanography of the Guerrero Negro and San Ignacio Lagoon systems and participants agreed to pursue arrangements for such a program.

Radio Tracking of Hawaiian Spinner Dolphins Begins

Warren Stuntz, Fishery Biologist, and a team of technicians including Richard Butler, Fishery Methods and Equipment Specialist, Tom Shay and Dale Fellbaum, Biological Technicians, have been on site in Kealakekua Bay on the island of Hawaii since October 20 to radio-tag and monitor the locations of radio-tagged spinner dolphins. The tagged dolphins are members of a resident school whose behavior is being studied under contract to NMFS by Dr. Bernd Würsig and associates from the University of California at Santa Cruz. This radio-tracking work will yield information on school cohesion, diurnal behavior patterns, and migration which may be used to understand better the effects of tuna fishing on stocks of dolphins in the Eastern Tropical Pacific.

Cooperative Net-Deepening Experiment Completed

The tuna seiner, Cabrillo, completed an NMFS-sponsored net-deepening experiment on October 7. Biological Technicians Gene Anderson and Mike Deerman collected leadline depth profiles, mid-net depth profiles, and enclosed-area measurements on the two fishing trips involved. The purpose of the experiment was to determine the effects of deepening a seine, by two standard net strips, on fishing depth and area enclosed. This experiment is based on acceptance of the hypotheses that increasing the enclosed area will lessen the probability of porpoise deaths due to net collapse and that increased fishing depth will yield greater catches of tuna. The relationship between increased net depth and increase in fishing depth and surface area will be developed from this experiment and will allow future estimations of net dimensions necessary to achieve desired depth and area characteristics.

MARINE MAMMAL ASSESSMENT AND MONITORING PROGRAM

Investigation Underway to Improve Method for Monitoring Porpoise Mortality

Biological Statisticians Nancy Lo and Bruce Wahlen are investigating ways to improve the currently used kill-per-day method for monitoring the porpoise mortality and the kill-per-set method for making annual porpoise mortality estimations.

Using the 1977 and 1978 kill data, Lo and Wahlen are comparing the statistical properties of various kill statistics for the 1) kill-per-day ratio estimate, 2) kill-per-day regression estimation, and 3) kill-per-trip

for total kill as well as the kill for the spotted dolphin. From among these three estimates, the kill-per-day ratio estimate has the lowest variance in most cases.

The kill-per-set algorithm is repeated with various stratifications of porpoise sets. These results are being compared with the present estimate in which up to eight vessel carrying capabilities are used. The preliminary results indicate that estimates with few strata have lower variances than that of the present stratification method and suggest that the data under the presnt algorithm are over-stratified.

Population Parameter Project

R. Holt and J. Powers (formerly Leader of the Marine Mammal Assessment and Monitoring Program, now at the NMFS, Southeast Fisheries Center) are co-authoring a paper concerned with the abundance estimations of dolphin stocks involved in the Eastern Tropical Pacific yellowfin tuna fishery. The paper has been received and the final draft is now being prepared.

Ecosystems Dynamics Project

Fishery Biologist David Au reports that the first Coastal Marine Mammal Survey from SWFC, led by Biological Technician Thomas Duffy was completed on October 24. The cruise aboard the NOAA research vessel, David Starr Jordan departed San Diego on September 27 and surveyed the area of the California Current from Cape Mendocino to Cabo San Lucas off Baja California. Logged were 189 cetacean and 86 pinniped sightings, representing 23 different species.

Delphinis delphis, the common dolphin, was most frequently seen (48 sightings) followed by Phocoenoides dalli (30). Free swimming pinnipeds seen included Zalophus (38 sightings), Callorhinus (22) and Mirounga (18).

Two rare species Bernardius bairdii, a beaked whale, and Kogia breviceps (?), the pigmy sperm whale, were seen off San Francisco (Berardius), Cape Mendocino (Berardius), and upper Baja California (Kogia). The photographs of Kogia, a mother and calf, are probably the best ever taken of this species in the wild; unfortunately the photos are not available for presentation in this issue.

Forty-three cetacean (and 12 pinniped) sightings were made off Baja California. The different cetacean sightings included Delphinus (12), Ziphius (5), Kogia (4), Mesoplodon (4), and Lagenorhynchus (4).

According to Dr. Au, the environment along the search track was monitored for temperture, salinity, depth, water color and chlorophyll-A content. On several occasions peaks in the chlorophyll-A content were associated with increased mammal and bird densities, a point which may be worth investigating further. Most of the cruise was monitored by NIMBUS-7 for color/chlorophyll at the sea surface, and it should be possible to link the observed biological activity with synoptic views of eddy systems and localizations of primary production in the California Current. These data will help to explain the nature of variability of mammal densities, the mechanisms causing aggregation, and the relative importance and sensitivity of various population areas to perturbations.

Data Editing Group

Frank Ralston, Leader of the Data Editing Group, reports that his staff has been occupied in the creation of new editing and processing programs for the 1980 observer program and the test data necessary for these programs.

Editing/processing of the 1979 observer trips is continuing on schedule.

Data Management Group

Ken Wallace has been generating data files for Biologists Warren Stuntz and Jacqueline Jennings. Stuntz is investigating the age structure of skulls of spotted dolphin for the last five years, while Jennings is interested in plots of tuna vessel set positions for the current year to be used in porpoise tag studies. Wallace has also been involved with producing the weekly porpoise mortality estimate.

Joe Caruso, Computer Programmer who recently transferred to the Data Management Group, has been creating the new computer programs and data bases for the 1980 data, as well as familiarizing himself with the entire group.

P. Tarantino has the responsibility of daily program scheduling and aborting. He has also reorganized the computer storage tapes and created new storage tapes for the data bases used in the Data Management System. Tarantino also monitors the disk storage use for the computer account.

PACIFIC ENVIRONMENTAL GROUP

OCEAN CLIMATOLOGY AND MONITORING

PEG Scientist Presents Paper on Fluctuations in Sea-Surface Temperatures Associated with Three Severe Winters

Dr. Douglas McLain attended the Fourth Annual Climate Diagnostics Workshop from October 16-18, in Madison, Wisconsin. This annual workshop was started by the NOAA National Climate Office and hosted by Universities. The sponsorship has now passed to the Climate Analysis Center, NWS and was hosted this year by the University of Wisconsin. Papers presented at the workshop described recent climatic conditions over North America and progress toward climatic predictions. The winter of 1978-1979 was the third of a series of severe winters over the eastern U.S. The first winter of the series, 1976-77, was most severe over the eastern seaboard; the second winter, 1977-78, most severe over the Great Lakes - Ohio Valley, and the recent winter, 1978-79, coldest over the northern Great Plains. All three winters had major effects on the Nation's economy.

McLain presented a paper in which he described fluctuations of sea surface temperature (SST) in coastal waters associated with these unusual winters. Temperatures along the east coast were below normal in all three winters, reaching 3.0 to 4.0° C below normal in some coastal areas. There were many effects on marine populations including a disastrous decline of white shrimp populations off the southeastern states. Off the west coast, SST's were above normal in the first two winters but normal or below normal this past winter. Mild conditions in Alaskan areas during recent winters have allowed a remarkable recovery of salmon stocks from their earlier depressed condition, following a series of severe winters there in the early 1970's.

The talk presented by McLain results from monitoring of oceanographic conditions in U.S. coastal areas. The talks presented at the Climate Diagnostics Workshops are published annually.

TIBURON LABORATORY

FISH COMMUNITIES INVESTIGATION

Activities of Kelp Forest-Fishes Related to Visual Pigments and Water Conditions

The crepuscular and nocturnal activities of fishes in California kelp forests can be related to the nature of their visual pigments, and to the varible water conditions that characterize their habitat. This is the subject of a major paper completed this month by Dr. Edmund S. Hobson, Leader of the Fish Communities Task at the Tiburon Laboratory, working in collaboration with Dr. William N. McFarland of Cornell University, and Fishery Biologist James R. Chess.

Despite the varied forms and habits of these fishes, those elements of their eyes that function in dim light have in common a maximum sensitivity to light of wave lengths near 500 nm. This fact indicates there is strong selection for enhanced photoabsorption over this narrow segment of the spectrum. The paper demonstrates that this spectral position more closely matches the spectral compositions of twilight and the luminescent emissions of certain planktonic organisms, than it does the spectral compositions of daytime sunlight, moonlight or starlight.

The basis for the special match, the authors contend, lies in predator-prey relationships. Smaller fishes are most threatened by predators during morning and evening twilight, and even slightly improved vision at this time is crucial to them. The acute need to sense threatening predators extends into the night, when bioluminescent plankton provide the cues needed to recognize danger. During most nights in California kelp forests, a moving object is readily seen owing to the luminescence of planktonic organisms that light up when disturbed. The paper desribes the enormous impact this fact has on the nocturnal tactics of both predators and prey, particularly how it restricts many kinds of predatory activities at night.

The authors have the position that defensive adaptations respond to sharper selection pressures than do offensive adaptations, with evidence drawn from the visual ecology of these fishes. Thus, various fishes that hunt over light sand at night (Figures 1 and 2), where apparently their vision is aided by increased moonlight and starlight, nevertheless have visual pigments more closely matched with bioluminescence. The same is true of certain nocturnal planktivores, like sub-adult olive rockfish (Sebastes serranoides) which have eyes tuned to bioluminescence even though their characteristic tail-down feeding attitude would seem adaptive in positioning the fish so that prey are visible against moonlight and starlight from above.

Fig. 1: A sub-adult kelp bass (Paralabrax clathratus) on open sand at night. Some individuals of this size feed under these circumstances even while larger and smaller individuals of this predominantly diurnal species are inactive close to rocks and algae.

Fig. 2: C-O sole (Pleuronichthys coenosus) feeds with equal effectiveness day and night on open sand. The position of its eyes, set on either side of a bony ridge, almost as if in a turret, permits it to scan the surrounding sea floor for the sand dwelling polychaetes on which it feeds.

Pugheaded Brown Rockfish Found to be Apparently Healthy

It has been suggested that fishes which have the condition known as pugheadedness feed less effectively and, therefore, suffer stunted growth. However, no evidence of this effect was seen in a pugheaded brown rockfish (Sebastes auriculatus) recently landed at the Tiburon Laboratory dock by the Rockfish Analysis Task.

As reported by Fishery Biologist Peter Adams of the Tiburon Laboratory in this first recorded instance of pugheadedness in brown rockfish, the condition is manifested in the same way as has been noted for many other species. Its forehead is acutely steep, its snout is shortened, and its eyeballs protrude abnormally (exophthalmy). Nevertheless, when measurements of 21 other morphological characteristics in this specimen were compared with similar measurements in normal fish, it differed significantly (95%) only in three. Its upper jaw and snout were both shorter (as expected), and the narrowest part of its caudal pedunde was wider. Not only is there no evidence of stunted growth, but, its eye diameter and interorbital distance were the same as in the normal fish. This last fact indicates that exophthalmy, at least in this specimen, results from the shortened jaw, and is not an independent condition, as has been suggested.

FISHERIES DEVELOPMENT INVESTIGATION

Marketing Study Made to Facilitate Export of U.S. Seafood to Japan

Task Leader Susumu Kato of the Tiburon Laboratory returned from a six week trip to Japan, where he studied various aspects of the Japanese fishing industry. Dr. Sunee Sonu, Marketing Specialist with the Southwest Region at Terminal Island, collaborated in the study. The chief objective of the trip was to study aspects of marketing which could facilitate export of U.S. seafood products to Japan.

Some positive results of the trip according to Kato were:

- Contacts made for trial shipment, processing, and sale of several species and products that are presently underutilized (shortbelly rockfish, octopus, sanddabs, fish eggs, squid, whelk, euphasids, purple sea urchins).

- Different, more direct pathways for selling fish to Japan were learned, and contacts made, as for example:

  - "Chinmi-ya" -- processors of so-called "delicacies."
  - "Tsukudani-ya" -- processors of seafood pickled or cooked in soy sauce.
  - Other processors of specialty products, including dried fish and some fishcake products.

- "Bento-ya" -- caterers (one firm makes 300,000 portions a day).
- Direct sales to supermarkets, department stores, and consumer cooperatives.

Kato and Sonu observed processing methods so that initial trials can be made here; possibly some products now imported from Japan can be replaced by domestic products (dried fish; salted squid; boiled octopus; salted sea urchin roe).

Finally a detailed study was made of surimi and kamaboko manufacturing. Kato believes that now preliminary experiments can be conducted here to determine the quality of U.S.-caught fish for surimi. Kato also arranged for the loan to the Tiburon Laboratory of some surimi-making equipment.

Three Species of Rock Crab Shipped to Massachusetts for Mechanical Processing Tests

Three species of rock crab were shipped to Gloucester, Massachusetts to test whether the body meat could be picked mechanically. Bob Learson of the Northeast Fisheries reported that separation of shell and meat was difficult because the hard parts were brittle, and readily passed through the separating screen.

Pink Shrimp Fishery Plan to be Presented to Council

Director Norman J. Abramson of the Tiburon Laboratory, a member of the Pacific Fishery Management Council's Pink Shrimp Management Plan Development Team, reported that the second draft of the Pink Shrimp Fishery Plan has been completed and will be presented to the Council at its December meeting. Following that, the Plan will be reviewed at a series of public meetings.

Pacific Fisheries Management Council

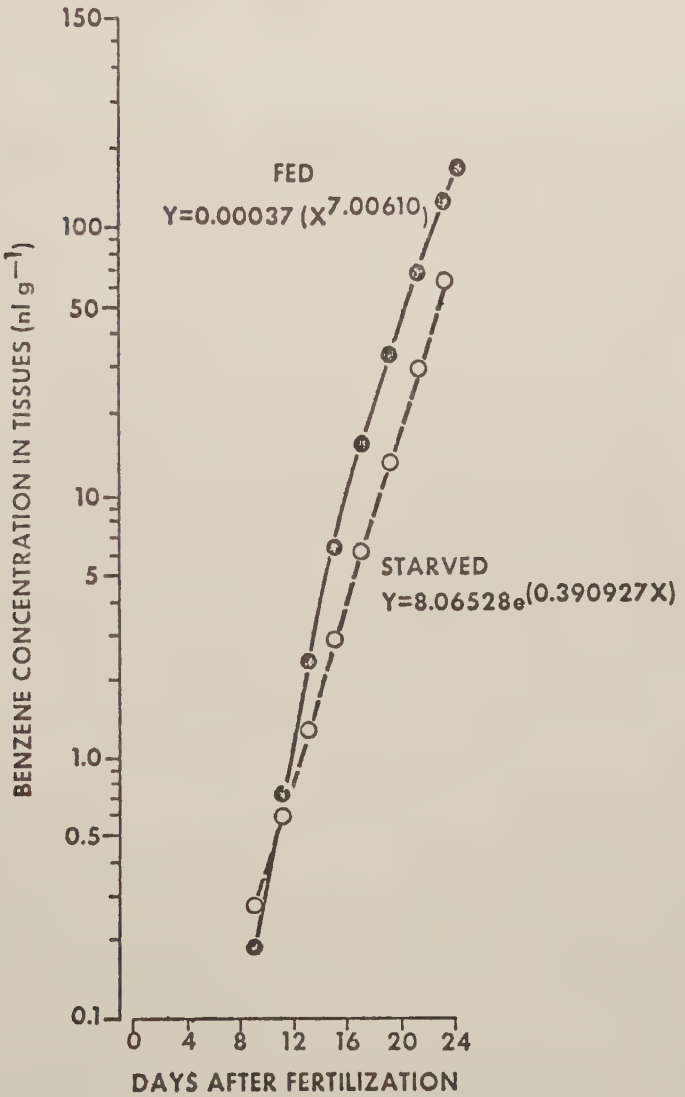
Edward Ueber, Economist, reports that the fifth draft of the groundfish plan has been completed and submitted to the Pacific Fishery Management Council. After review by the Council in November, the plan will undergo public hearings starting in December.

Mortality of Captive Salmon Alleviated

Fishery Biologist Roger Green at the Tiburon Laboratory reported that the mortalities in the salmon pens, which had caused concern last month, were alleviated and no disease symptoms were observed during October. Last month's moderate disease problem was diagnosed by the Department of Fish & Game's Pathology Laboratory as myxobacteria which proliferated during a period of warm water. A weight sample taken on October 19, 1979, showed that the young salmon had grown to an average size of 50 grams.

Gill net sampling at the Laboratory dock yielded seven tagged chinooks from last year's release. This is the first evidence of chinook salmon homing back to the Laboratory release site.

Two more carlin tags from the 1978 release were returned by anglers this month. The fish were taken from local ocean waters. Additionally, one tag from the 1976 release of chinook salmon was returned from a 22-lb. fish taken by an angler fishing just offshore of the Tiburon Laboratory. This constitutes the largest fish returned since the program started. Fourteen more of the nose-tagged fish recoveries were reported by California Fish & Game samplers. All were chinooks from last year's release. The ocean and bay salmon fishing season closed October 14.



Results of benzene concentration in tissues of fed and starved striped bass larvae.

PHYSIOLOGICAL ECOLOGY INVESTIGATION

Feeding Striped Bass Larvae Found to Accumulate Benzene at High Levels

Dr. Jeanette Whipple, Leader of the Physiological Ecology Investigation at the Tiburon Laboratory, reported that in recent laboratory experiments feeding striped bass larvae were found to take up and accumulate radiolabelled benzene to levels far exceeding the exposure concentration. From the age of eight days after fertilization, when the larvae have just begun active feeding, the larvae were exposed to a sublethal concentration of benzene. This concentration approximates levels of benzene found in various rivers and estuaries of the east and west coasts. Within 16 days larvae steadily accumulated benzene and/or its metabolities to approximately 1400 X the exposure level in fed larvae and to 460 X in starved larvae. These results can be seen in the accompanying figure.

As in previous experiments with other fish species Whipple and her associates found that fed larvae took up more benzene than starved larvae. A close examination of the benzene uptake in the larval food, brine shrimp (Artemia salina) over a 24-hour period was made. It showed Artemia accumulated benzene in a slower fashion than the larvae, reaching equilibrium within six hours after initial exposure. From an aqueous benzene concentration of 206 nl 1^{-1} the shrimp accumulated a maximum of 918 nl 1^{-1}. At the end of 24 hours 702 nl 1^{-1} was still present in shrimp tissues. The 24-hour pattern of uptake in striped bass larvae under our semi-static exposure system indicated that larvae first take up benzene from the water, usually to a maximum level within three hours. The larvae then began depuration only to exhibit a secondary uptake between six and twelve hours. A final depuration occurred between 12 and 24 hours. The delayed uptake in larval tissues coincides with the Artemia pattern and strongly suggests that benzene pathways operate through water and food. This was seen in Pacific herring larvae which fed on rotifers and further supports the hypothesis that petroleum-based hydrocarbons are biomagnified in some aquatic foodchains.

SOUTHWEST REGIONAL DATA MANAGEMENT AND ADP OPERATIONS

The following report on the many and varied activities of the Southwest Regional Data Management and ADP Operations was prepared by Data Systems Manager, Fred Kellenberger, and his staff.

Billfish Data Base Management System

The Billfish Data Base Management System was implemented for the Global Tuna Fisheries Analysis project this month. Final documentation will be completed in November. The system contains recovery and releasing data on billfish utilizing three data bases--address, release and recovery. There are about 1600 address records, 26,000 release records and 260 recovery records.

ADP Requirements Study

The ADP Requirements Study was completed by Potomac Research Incorporated (PRI) in October. PRI recommended that the ADP requirements of the Southwest Fisheries Center and Southwest Region can be best satisfied by a distributed data processing network. The study was distributed to the laboratory directors and division chiefs for review and comments. After appropriate comments are incorporated, the study will be sent to NOAA, D.C. and GSA for review.

Other Data Management Activities

Progress continues on the Coastwide Data System, which will contain vessel and landing information from the states of California, Oregon and Washington for the years 1974, 1975 and 1976. From the merged vessel tape, generated on the UCSD Burroughs system, the Vessel Data Base File was successfully implemented on the INFONET system for years 1974 thru 1976. The 1974 commercial landing data for Washington, Oregon and California have been processed on the Burroughs and merged onto 7 tapes, which were sent to INFONET. The almost 1 million records will be summarized after further code conversions and the summary data will be loaded into the Commercial Landing Data Base Files. Two runs, each run processing 10,000 records, have been made to estimate costs of execution. Various methods are being tested to reduce cost excluding the replacement of a program command construct and the generation of intermediate data bases. It is envisioned that these methods will reduce the total costs by 15%. Pre-processing of the 1975 and 1976 commercial landing files continues on the Burroughs. For these data sets a disk pack has been leased in order to relieve the memory load on the Burroughs central processor.

The Oceanographic Research Interactive Onboard Network (ORION) computer system project is still on schedule with a sea trial targeted for mid-December

1979. A contract is being negotiated to have the interface problems solved. The CalCOFI subsystem will be tested when the shipboard winch functions readout is completely installed.

Dorothy Roll, Computer Systems Analyst, reviewed and released the documentation for the final set of subroutines for the porpoise edit software package. The documentation for the complete series of 31 programs/subroutines is now under review by the Porpoise Data Management Group.

The National Data Management Committee (NDMC) met at the La Jolla Laboratory on October 24 and 25. The committee is responsible for the development, implementation and operation of national fisheries computer system. Members of the NDMC are ADP managers from each of the fisheries centers and Washington, D.C. The committee decided to concentrate on statistics, enforcement, catch and allocations systems.

MISCELLANEOUS

PRESS RELEASE

Honolulu Laboratory

October 26 - Research vessel completes cruise to Samoa.

La Jolla Laboratory

October 7 - La Jolla scientist cited for porpoise research.

SEMINARS

La Jolla Laboratory

October 16 - Dr. Francis Shepard, Professor Emeritus of Submarine Geology, Scripps Institution of Oceanography, spoke on "Currents in submarine canyons."

PUBLIC AFFAIRS

La Jolla Laboratory

October 24 - High school teachers from Bonita Vista High visited the Center for a lecture on oceanography given by Dick Evans. The visit was arranged by Peter Young, Instructor at the high school as part of their career orientation.

October 30 - A group of students from Standley Junior High School in University City toured the aquarium, led by Eric Lynn, Biological Technician. The students had an opportunity to observe a porpoise being dissected, experienced sand-dabs nibbling on their fingers, learned about artificial spawning of anchovy and mackerel, and viewed rotifers and copepods through the microscope. Among the students was Debbie Yoakum, daughter of Bobbi Watkins, Center Purchasing Agent, who helped arrange the visit.

TRAINING

Tiburon Laboratory

October 4-
November 15 - Susan Smith, Fishery Biologist - Biological Illustrations, California Academy of Sciences.

October 25-26 - Pete E. Benville, Fishery Biologist - Hazardous Chemical Safety, J.T. Baker Chemical Company.

VISITORS

Honolulu Laboratory

October 3 - Dr. Rick Grigg of the HIMB, University of Hawaii, visited R. Shomura to discuss NWHI studies.

15-17 - Masaru Onoda, Planning Officer, Japan Marine Fishery Resources Research Center (JAMARC), visited the Honolulu Laboratory library to extract available Pacific fishery information from published material.

18 - Ron Powell of Rarotonga visited H. Yuen to discuss ikasibi fishing techniques.

23 - Kurt Kawamoto, Marine Options Program, University of Hawaii, met with R. Shomura to discuss a NSF proposal.

- John Hoeffler of Seattle, Washington visited R. Shomura to discuss fishing in the Northern Mariana Islands area.

25 - Dr. Gerald Marten of the East-West Center met with R. Shomura to discuss Honolulu Laboratory's Western Pacific Council-related research.

La Jolla Laboratory

October 16 - George M. Johnson, John Hinman and Dale Gough, NASO, Seattle, Washington.

17 - Dr. Jacques Merle, ORSTOM, Paris, France.

22 - Mr. Masaru Onoda, Japan Marine Fisheries Resources Center, Tokyo, Japan. His host at the Center was Dr. Michael Laurs who arranged appointments for Mr. Onoda with Center, IATTC and Scripps scientists.

24-25 - Hoyt Wheeland, NMFS headquarters; Gene Heyerdahl, NEFC; Erich Groess, SEFC; and Bob Simpson, NWAFC.

26 - A.M. Vroomman, NMFS, Washington, D.C.; Robert Pedrick, NMFS, F5, Washington, D.C. and Len Subuman, NOAA Western Region National Weather Service.

- Professor Arthur Hasler, University of Wisconsin at Center to meet with Dr. John Hunter.

30 - Homeward bound from Fish Expo in Seattle, a group of Japanese businessmen visited the Center to discuss fisheries research here with Deputy Director John Carr. Among the group were: Takatoshi Onishi of the Kinki Nippon Tourist Co., Kikuzo Yamamoto, Manager of Tak and Co., Inc., Importers and Exporters, and Yoichi Wada, a member of the Fukuoka City Assembly in Fukuoka, Japan.

Pacific Environmental Group

October 18 - Ms. Carol Voit, NMFS, Washington, D.C.

Tiburon Laboratory

October 1 - Mike Moser, University of California at Santa Cruz, Center Coastal Marine Studies.

- Marv Jung, State Water Resources Control Board, Sacramento, CA.

- David Mackett, SWFC, La Jolla, CA.

- Jim Rote, NMFS, Washington, D.C.

- Bill Davoren, U.S. Fish and Wildlife Service, Sacramento, CA.

- Phyl Meyer, U.S. Fish and Wildlife Service, Sacramento, CA.

2 - Gene W. Pindt, Teglen Airdraulics, Burlingame, CA.

- Paul Krawchuk, NRS, Forestville, CA.

10 - M.J. Herz, University of California at San Francisco, CA.

- Bill Davoren, U.S. Fish and Wildlife Service, Sacramento, CA.

12 - P.A. Meyer, U.S. Fish and Wildlife Service, Sacramento, CA.

- Gene Forbes, U.S. Fish and Wildlife Service, Sacramento, CA.

- Terry Waddle, U.S. Fish and Wildlife Service, Sacramento, CA.

- H.T. Kemp, U.S. Fish and Wildlife Service, U.S. Fish and Wildlife Service, Portland, OR.

- Roger D. Johnson, U.S. Fish and Wildlife Service, San Francisco Bay Northwest Region, Fremont, CA.

- Robert Hayden, U.S. Fish and Wildlife Service, Sacrameto, CA.

- Robert E. Cleary, U.S. Fish and Wildlife Service, Portland, OR.

- Stacey Bellis, Scoma's Restaurant, Kentfield, CA.

- Dan Wertz, Scoma's Restaurant, Kentfield, CA.

- Mary S. Johnson, Fremont, CA.

- John Klein, K & K Marketing, San Rafael, CA.

- Roland Finch, National Marine Fisheries Service, Washington, D.C.

- Raoul Anderson, National Marine Fisheries Service, Washington, D.C.

- P.A. Meyer, U.S. Fish and Wildlife Service, Sacramento, CA.

13 - Chuck and Lynette Shunk, Southern Pacific, Rod & Gun Club, Santa Rosa, CA.

- Ed (?), Angler Magazine, Oakland, CA.

- Jack Gordon, California Striped Bass, Bass Association, Stockton, CA.

- Wayne Gomes, Santa Clara Valley Sportsmens' Association, Santa Clara, CA.

- Phil Abelar, Angler Magazine, Cupertino, CA.

- Leland Saefor, Petaluma Outdoorsmen, Petaluma, CA.

- Everett L. Sartori, Petaluma Outdoorsmen; Salmon Unlimited; Roddy Creek Hatchery, Pelaluma, CA.

- Harry E. Bockhop, Ingleside Sportsmen District Council #7 AFC, San Francisco, CA.

- Jim White, California Department of Fish & Game, Stockton, CA.

- Vincent Vitrano, Associated Sportsmen of California, San Francisco, CA.

- Marv Jung, State Water Resources Control Board, Sacramento, CA.

16 - Edison Tse, Stanford University, Stanford, CA.

- Arvind Khilnani, Standford University, Standford, CA.

17 - Fred L. Olson, Intl. Fisheries Development & Services Division, Washington, D.C.

- A.J. Bilik, National Marine Fisheries Service, Washington, D.C.

- Edison Tse, Stanford University, Stanford, CA.

- Stephanie Cincotta, Port of San Francisco, San Francisco, CA.

- Mike Orbach, University of California at Santa Cruz, CA.

19 - Jim Stanfield, U.S. Army Corps of Engineers, San Francisco, CA.

- Michael Fraser, National Marine Fisheries Service, Terminal Island, CA.

- Carol J. Voit, NOAA, Washington, D.C.

- Robert Pata, National Marine Fisheries Service, San Francisco, CA.

23 - Frank Palmer, State Water Resources Control Board, Sacramento, CA.

- John Ladd, California Department of Fish & Game, Sacramento, CA.

- Michael Martin, California Department of Fish & Game, Monterey, CA.

- Gerald Bowes, State Water Resources Control Board, Sacramento, CA.

- Charles J. Barkle, Microchart Systems, Inc., San Rafael, CA.

24 - Steve Zraka, Ecological Analysts, Inc., Walnut Creek, CA

- Tom Cannon, Ecological Analysts, Inc., Walnut Creek, CA.

- Johnson Wang, Ecological Analysts, Inc., Walnut Creek, CA.

- Rick Sitts, Ecological Analysts, Inc., Walnut Creek, CA.

25 - K. Takayama, Wescon, San Francisco, CA.

MEETINGS AND TRAVEL

Honolulu Laboratory

September 29 - Hazel S. Nishimura, Librarian, and George W.T. Liao, Operations Research Analyst, attended an Ohio College Library Center (OCLC) demonstration session at Hamilton Library, University of Hawaii.

October 3 - Richard S. Shomura, Director, Honolulu Laboratory, returned to Honolulu after meeting with government officials in Apia, Western Samoa. While in Western Samoa, he attended a luncheon-meeting aboard the Townsend Cromwell.

5 - R. Shomura called a meeting of the Billfish Plan Development Team including Drs. Michael F. Adams, Roy Mendelssohn, and Jerry A. Wetherall, and H. Yuen to discuss the billfish FMP.

- Honolulu Laboratory members of the Spiny Lobster Plan Development Team Including Drs. Adams, Mendelssohn, and Polovina and R. Uchida and Howard O. Yoshida met with other team members, Craig MacDonald, University of Hawaii graduate student, and Chairman Henry Sakuda, Hawaii Division of Fish and Game, to discuss the fifth draft of the FMP.

9 - R. Shomura and H. Yuen attended a meeting at the University of Hawaii Sea Grant to discuss the NWHI research program.

- R. Shomura met with Dr. Jack Davidson of the University of Hawaii Sea Grant to review an Ocean Thermal Energy Conservation (OTEC) proposal.

10-11 - Dave Mackett, SWFC La Jolla, presided over a planning meeting for NMFS turtle research in the central and western Pacific, attended by R. Shomura, R. Uchida, H. Yoshida, and George Balazs, Hawaii Institute of Marine Biology (HIMB), University of Hawaii.

13-20 - R. Shomura was in Rarotonga as a member of the U.S. delegation in treaty negotiations with the government of the Cook Islands.

15-16 - Dr. Mendelssohn represented R. Shomura at the 20th WPRFMC meeting in American Samoa.

16-17 - Dr. Wetherall represented R. Shomura at the Center management meeting at La Jolla.

La Jolla Laboratory

October 1 - Director Barrett attended a Underwater Parks meeting at San Diego as a member of the Board.

2 - F. Kellenberger was in Terminal Island to attend a PACES meeting and to meet with CF&G personnel and James Bybee of the Southwest Region to discuss statistical reports.

3 - Messrs. G. Stauffer, R. Lasker, A. MacCall, and D. Hanan attended meeting convened by Radovich at La Jolla to investigate the status of the anchovy stock.

3-5 - Messrs. D. Au, R. Evans, M. Laurs, R. Lynn and L. Eber traveled to Lake Arrowhead to attend the Eastern Pacific Oceaic Conference.

7-11 - J. Jennings, C. Oliver, A. Myrick, J.Coe, F. Ralston, W. Stuntz, D. Au, R. Holt and J. Henderson attended the 3rd Biennial Conference on the Biology of Marine Mammals. Dr. W. Perrin also attended this meeting and subsequent meetings on U.S. foreign cooperative research.

7-20 - David Holts was in Seattle to attend the 3rd Biennial Conference on the Biology of Marine Mammals and to work on net sealing and modeling studies.

9-10 - Director Barrett and Dr. D. Huppert were in Portland, Oregon to attend the Scientific and Statistical Committee meeting of the Pacific Marine Fishery Management Council.

9-11 - D. Mackett was in Honolulu to conduct research planning for the Central and Western Pacific Turtle Program.

11 - Fisk and Heinman met with MacCall and Hanan in La Jolla to review the State-Federal program.

11-12 - F. Kellenberger was in Seattle to meet with personnel from the Northwest and Alaska Fisheries Center and the Northwest Region regarding the Fishery Information System.

12 - Huppert met with Sea Grant and California Seafood Institute representaives at Institute of Marine Resources (SIO) to discuss economic study of California fishing industry.

15-17 - Economists S. Herrick and J. McMillan traveled to the Southwest Fisheries Center Laboratory at Tiburon to attend a NMFS meeting of economists.

15-19 - Dr. D. Huppert also attended the above meeting at Tiburon and subsequently traveled to the University of California at Davis to give a presentation on fisheries.

16 - Shogo Masuo, Shizuoka, Japan, accompanied by Rick Naseff of the U.S. State Department visited the Center to discuss the handling of sportfishing data with Jim Squire.

16-17 - Carol Voit, Fx52, Dale Gough, George Johnson, John Hinman and Chris Fee, NASO here for Center Management meeting.

17 - Stauffer and MacCall attended a workshop on anchovy-pelican interactions at UC Davis.

- Dr. G. Stauffer was in Davis, California to participate in the anchovy/pelican meeting.

17-18 - Huppert consulted with graduate students and presented a talk on current economic issues in fisheries management, under the sponsorship of Dr. Warren Johnston at UC Davis.

18-19 - Fred Kellenberger traveled to Portland to attend the Pacific Marine Fisheries Commission (PMFC) meeting on data requirements.

19 - MacCall and Hanan attended a meeting of the Director's Advisory Panel (CFG) in Long Beach to review the draft bonito management plan.

19-29 - Director Barrett was in Panama City, Panama to attend the 37th meeting of the Inter-American Tropical Tuna Commission.

21-24 - Dr. G. Sakagawa traveled to Panama City, Panama to attend the 37th meeting of the Inter-American Tropical Tuna Commission.

22-25 - Attending the CalCOFI Conference held this year at Idyllwild, California were the following staff members of the La Jolla Laboratory: J. Butler, E. Sandknop, C. Kimbrell, G. Theilacker, S. D'Vincent, R. Lasker, S. Picquelle, G. Stauffer, J. Brown, B. Stevens, B. MacCall, R. Charter, G. Moser, E. Barham, R. Lynn and D. Roll.

22 - Lasker, Huppert, Stauffer, MacCall attended a meeting of the INP/CalCOFI Coordinating Committee in La Jolla.

21-29 - Lasker traveled to Brookhaven, New York to attend a PROBES meeting.

30-31 - Director Barrett attended a meeting at the Bahia Hotel with representatives of Mexico and Costa Rica regarding negotiation of the Eastern Pacific Tuna Convention.

October 29-
November 1 - Drs. G. Sakagawa and W. Parks traveled to Washington, D.C. to attend a pre-International Commission for the Conservation of Atlantic Tunas Advisors Meeting.

Pacific Environmental Group

October 16-17 - Mr. Gunter Seckel traveled to La Jolla, CA to attend the Center Management meeting.

22-25 - Ms. Donna Mallicoate, Dr. Richard Parrish, Mr. Andrew Bakun and Mr. David Husby traveled to Idyllwild, Ca to attend the CalCOFI meeting.

Tiburon Laboratory

October 9-12 - Ed Ueber traveled to Portland to present Groundfish Management Plan to the Pacific Fishery Management Council.

13 - The staff of Tiburon Laboratory's Physiological Ecology Investigation together with members of the State Water Resources Control Board and California Department of Fish and Game co-hosted a Striped Bass meeting at Tiburon. The meeting was requested by sports fishermen who wished to learn more about the Laboratory's research on the impact of pollution on the striped bass population. About thirty representatives of sportsmen's organizations, commercial sportfishing operators, and sportfishing writers attended the meeting.

16-17 - Ueber attended a meeting of economists at the Tiburon Laboratory, chaired by Mort Miller, and which included Martha Blaxall and Richard Gutting of NOAA, Washington, D.C.

17-19 - Dr. J. Whipple attended meeting of Microconstituent's Committee of NOAA, in Gloucester, MA.

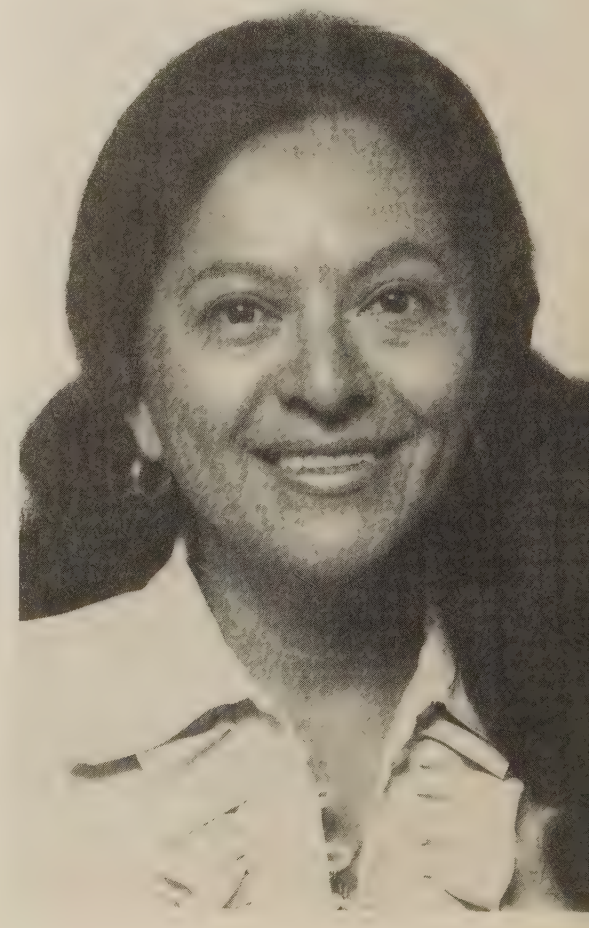
19 - Ed Ueber, at the request of Pacific Fishery Management Council, attended a meeting of gillnetters and sportfishermen in Long Beach, CA.

PERSONNEL

Sandknop Appointed as EEO Counselor

Elaine Sandknop, Biological Technician, was officially appointed as the Equal Employment Opportunity Counselor for the La Jolla Counseling Area on June 14. She assumed her duties as Counselor after completion of the required course in basic EEO counseling on October 22, 1979.

According to Sandknop, the EEO Counselor is the first stop for an employee or applicant who "believes he or she has been discriminated against in some aspect of his or her job relationships because of race, color, religion, sex, age or national origin." The Counselor's role is to make every effort to resolve EEO complaints on an informal basis.
Sandknop will complete 15 years of service with the La Jolla Laboratory in December 1979.



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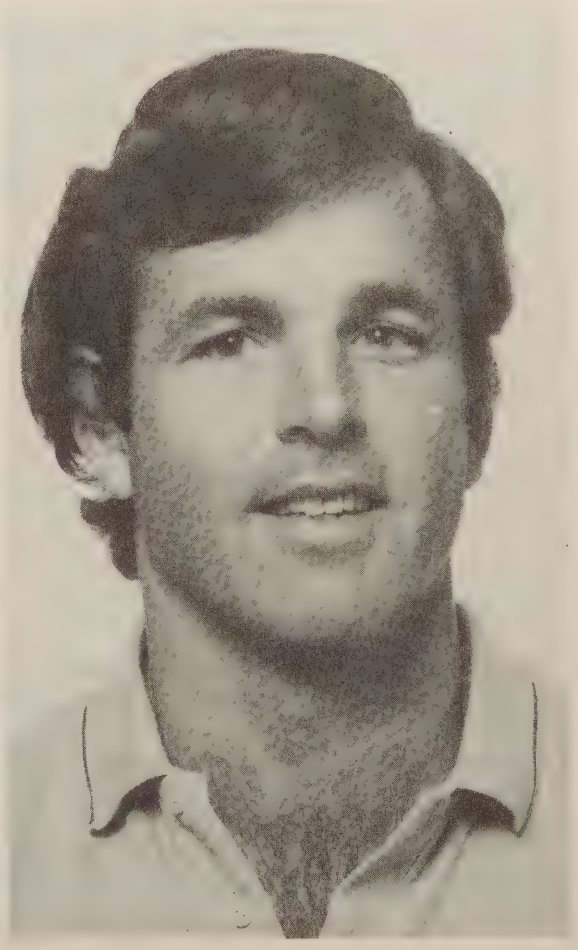
Dr. Reuben Lasker who served as campaign chairman of the 1979 Combined Federal Campaign reported that employees of the Southwest Fisheries Center and La Jolla Laboratory generously contributed $3,504.

New Additions to Center Staff

Daisy I. Gaston, Budget and Accounting Technician. Gaston is on the staff of Ben Remington, Center Executive Officer and is a transfer from the Naval Supply Center in San Diego.



Sam Herrick, Industry Economist on the staff of the Tuna Resources Program, supervised by Dr. Wes Parks. Herrick received his Ph.D. in Economics in August 1979 from Oregon State University.

Personnel Actions

Honolulu Laboratory

The following temporary employees were returned to the rolls:

Andrew J. Aldridge, Biological Technician (Fisheries)
James C. Cooper, Biological Technician (Fisheries)
George C. Evering, Jr., Biological Technician (Fisheries)
Alan R. Everson, Biological Technician (Fisheries)
Sharon D. Hendrix, Biological Aid (Fisheries)
Linda C. Hubbell, Biological Aid (Fisheries)
Linda L. Hudgins, Economist
Andrea S. Johnson, Time and Leave Clerk
Brian S. Joyo, Biological Aid (Microbiology)
Henry M. Kishinami, Biological Aid (Fisheries)
Brent M. Miyamoto, Computer Aid
Christine E. Siu, Biological Aid (Microbiology)
Laurie L. Tsuji, Computer Technician
Maria S. Wallace, Clerk (Typing)

- Andrea S. Johnson, Time and Leave Clerk - Expiration of 700-hour appointment.

- Ray F. Sumida, Supervisory Fishery Biologist (General) - Promotion.

- Maria S. Wallace, Clerk (Typing) - Reassignment to Time and Leave Clerk.

La Jolla Laboratory

September 30 - Ray Stives, Biological Technician - Extension of Temporary Appointment.

October 1 - Philip Tarantio, Statistical Clerk - Excepted Appointment.

- Cynthia Haight, Biological Aid - Excepted Appointment.

- Lonnie Dick, Biological Aid - Excepted Appointment.

- Selma Levin, Clerk Typist - Excepted Appointment.

7 - Stanley Moore, Computer Programmer - Promotion.

9 - Cynthia Thomson, Economist - Temporary Appointment.

19 - Marleen DiBona, Administrative Clerk - Transfer

20 - Bonnie Neece, Clerk Typist - Transfer

23 - Sandra Johnson, Biological Aid - Temporary Appointment.

Tiburon Laboratory

October 19 - Dorothy Ruse, Clerk-Steno - Resignation.

23 - Michael F. McGowan, Biological Aid - Temporary Appointment.

25 - Nancy Stapp, Co-op Student - Resignation.

30 - Marguerite Ryan, Clerk-Steno - Temporary Appointment.

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